

COMMONWEALTH OF VIRGINIA

ENTERPRISE TECHNICAL ARCHITECTURE (ETA)

Electronic Records Management Topic Report

INFORMATION DOMAIN

Version 1.0

Virginia Information Technologies Agency (VITA)

Prepared by:
Electronic Records Management Team

Electronic Records Management Team Members

John B. Breeden..... Virginia Department of Transportation
 Jim B. Brown,City of Richmond
 Morris Campbell City of Norfolk
 Barbra Caris Virginia Department of Social Services
 Jim Clements..... Virginia Information Technologies Agency
 Prin Cowan Motor Vehicle Dealer Board
 Matthew J. Davis..... Virginia Department of Corrections
 Edward Ernouf Virginia Indigent Defense Commission
 Bernie Farkas Department of Environmental Quality
 Paul Flanagan Virginia Information Technologies Agency
 Vickie Gephart Department of Environmental Quality
 J. Michael Gillis Virginia Department of Corrections
 Goode, Jeffrey Virginia Department of Social Services
 Robert H. Jenkins..... Virginia Department of Juvenile Justice
 Ben Lewis.....I.Q Business Group
 JP Long Virginia Commonwealth University
 Eric B. Perkins (Facilitator) Virginia Information Technologies Agency
 L. L. Pierce Virginia Commonwealth University
 Kevin Platea Virginia Department of Social Services
 Kathy Siddall Department of Health Professions
 Corey Smith Library of Virginia
 Jeff Snyder.....Library of Virginia
 Anita Vannucci.....Library of Virginia
 Bob Vilcheck Department of Human Resource Management
 Richard G. Waiton Virginia Department of Transportation
 Herb Ward..... Department of Environmental Quality
 Pam Watson Department of Human Resource Management
 Michael Wilson Department of Conservation and Recreation

Reviews

- This publication was reviewed and approved by VITA's Policy, Practice and Architecture Division.
- Online review was provided for agencies and other interested parties via the VITA Online Review and Comment Application (ORCA).

Publication Version Control

Questions related to this publication should be directed to VITA's Policy, Practice, and Architecture (PPA) Division. PPA notifies Agency Information Technology Resources (AITRs) at all state agencies, institutions and other interested parties of proposed revisions to this document.

This following table contains a history of revisions to this publication.

Version	Date	Revision Description
1.0	April 4, 2011	Initial Report

Identifying Changes in This Document

- See the latest entry in the revision table above.
- Vertical lines in the left margin indicate the paragraph has changes or additions. Specific changes in wording are noted using italics and underlines; with italics only indicating new/added language and italics that are underlined indicating language that has changed.

Table of Contents

<i>Executive Summary</i>	1
<i>Introduction</i>	2
Background	2
Definition of Key Terms	2
Glossary	2
Agency Exception Requests	2
Electronic Records Management Report	3
Electronic Records Management Purpose	3
<i>Topic-wide Principles, Requirements and Recommended Practices</i>	5
Topic-wide Principles	5
Topic-wide Requirements	5
Topic-wide Recommended Practices	7
<i>Life Cycle Phases of Electronic Records</i>	8
Create Phase	8
Access Phase	9
Maintain Phase	10
Store Phase	10
Dispose Phase	11
References	13

Executive Summary

The Virginia Public Records Act (VPRA) was created to help ensure that the procedures used to manage and preserve public records are uniform throughout the Commonwealth. The Library of Virginia (LVA) is responsible for defining what constitutes a public record and providing assistance to public entities to ensure those records are maintained, disposed of, and as appropriate, available for reference to current and future generations.

Public records are the output of the business and administrative processes of an agency. Records management is a process of ensuring the proper creation, maintenance, use and disposal of those records throughout their life cycle to achieve efficient, transparent and accountable governance. Records management ensures that all the records of an agency created in the conduct of official business are, and remain, authoritative and authentic.

The Commonwealth's *Electronic Records Management (ERM) Topic Report* provides guidance and direction to public entities to address the unique requirements for those public records that are electronic in form. ERM is designed to assist agencies to identify and manage electronic records effectively and efficiently through the establishment of an appropriate set of records management controls. ERM provides a proactive framework to manage electronic records through their life cycle. It starts at the initial development stage of an automated application and continues through the retirement of any associated electronic records.

Requirements and recommended practices presented in this document establish guidance and direction for the management of an agency's electronic records.

Introduction

Background

The Commonwealth's Enterprise Architecture (EA) is a strategic asset used to manage and align the commonwealth's business processes and Information Technology (IT) infrastructure/solutions with the State's overall strategy.

The EA is also a comprehensive framework and repository which defines:

- the models that specify the current ("as-is") and target ("to-be") architecture environments,
- the information necessary to perform the commonwealth's mission,
- the technologies necessary to perform that mission, and
- the processes necessary for implementing new technologies in response to the commonwealth's changing business needs.

Definition of Key Terms

This document presents architecture direction for agencies when planning or making changes or additions to their information technology through:

- Requirements – statements that provide mandatory Enterprise Architecture direction.
- Recommend Practices – statements that provide guidance to agencies in improving cost efficiencies, business value, operations quality, reliability, availability, decision inputs, risk avoidance or other similar value factors. Recommended Practices are optional.

Glossary

As appropriate, terms and definitions used in this document can be found in the COV ITRM IT Glossary. The COV ITRM IT Glossary may be referenced on the ITRM Policies, Standards and Guidelines web page at <http://www.vita.virginia.gov/library/default.aspx?id=537>.

Agency Exception Requests

Agencies that want to deviate from the requirements and/or technology standards specified in COV ITRM Standards may request an exception using the *Enterprise Architecture Change/Exception Request Form*. All exceptions must be approved prior to the agency pursuing procurements, deployments, or development activities related to technologies that are not compliant with the standard. The instructions for completing and submitting an exception request are contained in the current version of *COV ITRM Enterprise Architecture Policy*. The Policy and exception request form is on the ITRM Policies, Standards and Guidelines web page at <http://www.vita.virginia.gov/library/default.aspx?id=537>.

To request an exception to all Security related ITRM Standards please refer to the *Process for Requesting Exceptions* section of the Information Security Policy - COV ITRM Policy SEC519 on the ITRM Policies, Standards and Guidelines web page at <http://www.vita.virginia.gov/library/default.aspx?id=537>.

Electronic Records Management Report

This report addresses the management of electronic records. It provides a framework to apply effective and efficient management practices to electronic records by designing the necessary features into a new or substantially upgraded IT system. Requirements introduced in this report will be incorporated into the COV *ITRM Enterprise Architecture Standard* and/or *Policy*. As appropriate, terms and definitions used in this document can be found in the COV ITRM IT Glossary which may be referenced on the VITA ITRM Policies, Standards and Guidelines web page at <http://www.vita.virginia.gov/library/default.aspx?id=537>.

Electronic Records Management Purpose

The Virginia Public Records Act (VPRA) was created to help ensure that the procedures used to manage and preserve public records are uniform throughout the Commonwealth. The Library of Virginia (LVA) is responsible for providing the support and guidance agencies and localities need to fulfill their obligation to maintain and make available public records throughout their life cycle. The *Code of Virginia* §42.1-85 identifies agencies as being responsible for ensuring that their public records are preserved, maintained, and accessible throughout their lifecycle, including converting and migrating electronic records as often as necessary so that information is not lost due to hardware, software, or media obsolescence or deterioration. LVA, through its Records Analysis Services (RAS), assists public entities by publishing Records Retention & Disposition Schedules¹, presenting workshops, monitoring the disposal of non-permanent records, and assisting with the transfer of permanent records to the State Archives.

The *Code of Virginia* § 42.1-77 defines what constitutes a public record; and the LVA provides assistance to public entities to ensure those records are maintained, disposed of, and as appropriate available for reference to current and future generations.

The ERM is needed to provide guidance and direction to public entities to address the unique requirements for those public records that are electronic in form. The ERM is applicable to all executive branch agencies and institutions of higher education that use electronic means in creating, maintaining, using or disposing of records in support of conducting public business.

Electronic records (E-Records) are defined in the Virginia Public Records Act as follows:

"Electronic record" means a public record whose creation, storage, and access require the use of an automated system or device. Ownership of the

¹ Library of Virginia, Records Management State Agency General Schedules, 2009:
http://www.lva.virginia.gov/agencies/records/sched_state/index.htm

hardware, software, or media used to create, store, or access the electronic record has no bearing on a determination of whether such record is a public record.”

The LVA also notes that those public records that are in electronic form pose their own unique challenges, and must be scheduled, maintained, and disposed of in the same manner as paper records.

The Library’s rules for managing electronic records are published on their Web site and may be found at:

<http://www.lva.virginia.gov/agencies/records/electronic/index.htm> .

Topic-wide Principles, Requirements and Recommended Practices

The ERM is a guide that uses relevant records management procedures (i.e., context and conditions) to help business process owners identify and integrate records management related principles, requirements and recommended practices into all aspects of agency business operations. This section identifies those principles, requirements and recommended practices that cross all five electronic records life cycle phases.

Topic-wide Principles

The following principle is established to provide overall guidance to public entities in managing their electronic records.

- ERM-P-01** **Virginia's E-Records Are Public Assets** – Public electronic records are Commonwealth assets and must be effectively managed throughout their life cycle.

Topic-wide Requirements

The following are topic-wide requirements:

- ERM-R-01** **Develop IT Systems with ERM Capability** – When an agency builds a new automated system or significantly updates an existing automated system, the agency shall ensure that the system has the ability to manage records by their appropriate State Agency Records Retention & Disposition Schedules
- ERM-R-02** **ERM Training and Awareness** – Agencies shall require training and education programs for all aspects of electronic records management to be an integral and ongoing component of an agency records management program.
- ERM-R-03** **External Service Providers** – Agencies shall ensure that all contracts related to external providers hosting applications that contain Commonwealth identified public records have appropriate terms and conditions that require the vendor to manage those electronic records in compliance with the agency approved records retention and disposition schedule.

Rationale

Public records must be maintained and disposed of to comply with approved records retention and disposition schedules regardless of their format or who is maintaining the records.

- ERM-R-04** **Timely Disposition for Electronic Records** – Agencies shall establish, maintain and implement procedures to ensure all

public electronic records are retained until no longer needed and disposed of in accordance with their corresponding approved LVA retention and disposition schedule.

Rationale

- Determines how long to keep electronic records to meet legal, business, and historical needs, based on the agency's approved records retention and disposition schedule.
- Confirms the agency approved records retention schedule and disposition authority, which identifies its business records in any format including electronic.
- Ensures procedures are in place to allow the application of retention schedules so that records that have met retention requirements can be identified and disposed of according to their corresponding retention schedule.

ERM-R-05

Accessibility During the Life cycle of Electronic Records –

Agencies shall take appropriate measures to ensure electronic records are accessible for as long as required by their approved records retention and disposition schedule. Measures could include but are not limited to maintaining the hardware, software and media necessary to access the records; maintaining the pertinent technical expertise, manuals and documentation required to use this hardware, software, and media in order to access the records; refreshing electronic storage media; or converting those records to a different format that makes the records accessible.

Rationale

- Ensures that electronic records are stored on appropriate devices based on business needs, preservation requirements, and costs.
- Ensures regular integrity checks on performed electronic storage devices.
- Ensures electronic storage media are monitored and periodically refreshed to prevent data loss through media degradation and obsolescence.

ERM-R-06

Replacement or Upgrading of Legacy Systems – When existing systems are replaced or upgraded, agencies shall ensure electronic records stored in the old system are either:

- i. maintained and managed in the old system until appropriately disposed according to their applicable retention and disposition schedules; or
- ii. migrated and managed in the new system until appropriately disposed according to their applicable retention and disposition schedules.

Rationale

- Ensures an approach to preserving electronic records has been selected based on business needs, how well the approach will serve them and the agency's capacity to support the approach (financially and technically) in the long term.
- Ensures preservation strategies are implemented and proactively promulgated to relevant staff such as, business owners, IT management and records management.
- Ensures electronic records and associated metadata are usable and accessible with current and future technology
- Ensures when electronic records are transferred between agencies, the records and associated metadata are transferred in data formats that are accessible and functional for the receiving agency

Topic-wide Recommended Practices

No topic-wide recommended practices have been identified to-date.

Life Cycle Phases of Electronic Records

The remainder of this report is organized by phases associated with the normal life cycle of an electronic record. The following phases include requirements pertaining to electronic records management that have been published by nationally and internationally recognized standards-setting organizations.

Create Phase

The create phase begins at the point in time when a public record is first created in an electronic format and stored in an automated system.

Requirements related to the create phase include the following:

ERM-R-07

Electronic Records' Metadata – Each electronic record created shall have metadata sufficient to manage the record throughout its life cycle. Types of metadata must include, but are not limited to, the following:

- i. "Descriptive" metadata allows for basic identification of a record through title, author, and keywords.
- ii. "Structural" metadata indicates how objects are put together, for example, how pages are ordered to form chapters.
- iii. "Administrative" metadata includes technical information to help manage a document, such as file type, creation date, format, and access restrictions.

Rationale

- Ensures that standardized metadata is created to facilitate recordkeeping and disposition sufficient for the agency business needs.
- Ensures creation and capture of metadata occurs as a normal part of business process and recordkeeping operations.
- Ensures classification criteria have been developed to assist with titling, indexing, and retrieving electronic records.

The following is the create phase recommended practice:

ERM-RP-01

Electronic Records File Management Plan – Each agency should create and maintain an electronic records file management plan as a part of their agency file management plan.

Rationale

- Facilitates the management of electronic records.
- Enables accountability through full and accurate records
- Assists the agency to meet the legal responsibilities mandated in the *Code of Virginia*.
- Determines how files will be arranged, categorized, accessed, and stored, whether in paper or electronic format. Having good filing practices ensures that the right file can be retrieved quickly at the right time for the lowest possible cost.

Access Phase

The access phase begins after a public record is initially created and stored in an electronic format. Access is defined as the right bestowed by law to access public records and includes the opportunity and means of finding, using, or retrieving information from public records stored in electronic formats.

Security controls related to sensitive information contained in electronic records and user authentication and authorization are directly related to the access phase. These controls are needed to protect electronic public records from:

- intentional or unintentional damage;
- unauthorized access;
- tampering; and
- unauthorized modification.

Access phase requirements related to security controls are addressed by the current version of COV ITRM *Information Security Standard* SEC501 which can be found at www.vita.virginia.gov . Security controls are essential to ensure:

- protection of electronic records from intentional or unintentional damage, unauthorized access, tampering or unauthorized modification;
- electronic systems are designed and managed to protect confidential information while providing access by the public to their electronic records and record's metadata;
- electronic records are managed according to the Library of Virginia approved retention schedule, and their metadata, are accessible and usable as appropriate by the public;
- the infrastructure is in place to meet public and official demands for access to electronic records;
- agency procedures and practices control the appropriate assignment of access permissions to users; and
- agency procedures are in place to identify and respond to incidents or attempted security breaches of systems that create or store electronic records.

Maintain Phase

The maintain phase includes the maintenance in an unaltered form of an electronic record together with its metadata.

Requirements related to the maintain phase include:

ERM-R-08

Disaster Preparedness Plan – Agencies shall maintain an adequate electronic records disaster preparedness plan for the protection of agency electronic records and to assist in the recovery of agency electronic records from a disaster.

Rationale

- Ensures procedures and practices are in place to minimize the risk of electronic records being lost or damaged as a result of disaster.
- Identifies vital electronic records and ensures that they receive appropriate priority in business continuity plans.
- Ensures that business continuity plans include appropriate recovery and restoration procedures for electronic records.

Store Phase

The store phase occurs after an electronic record is no longer needed to support current business practices and prior to that record completing its LVA established retention period. During this period of time, the electronic record must be safely stored until such time that it can be properly disposed of. In this phase, an electronic record may be inactive or semi-active and used to support other activities such as research.

In many cases agencies will maintain electronic records in automated solution databases until those records meet their retention criteria, when they will be removed from the active files through disposition processes. This means that the same hardware, software and storage media is used for active electronic records (maintain phase) as for non-active records.

In cases where an automated solution is being shut down, upgraded, or replaced and the old solution contains electronic records that are inactive and that have not completed their established retention criteria, the agency has the choice of converting those records to the new solution and maintain them until they meet the retention criteria or keep those records in the old solution and maintain the records and the solution until those records complete the retention criteria.

The requirement related to the store phase is:

ERM-R-09

Safekeeping Electronic Records in Storage – Agencies shall store electronic records no longer needed to support current business practices but that have not satisfied their LVA established retention criteria by:

- i. ensuring the same level of safekeeping as when the electronic records were first created and used to actively support agency business needs;
- ii. ensuring that those electronic records can continue to be accessed electronically through hardware, software, and media migrations and upgrades; and
- iii. ensuring the pertinent manuals and documentation required to use this hardware, software, and media in order to access the records are maintained.

Rationale

- Ensures the same level of care and custody is provided to the electronic records in storage as when it was in active and working use.
- Ensures the availability of access to the electronic records while in storage by storing and, if necessary, also storing and maintaining the hardware, software, and media used to access the record.

Dispose Phase

The dispose phase addresses an electronic records final disposition; either destruction or permanent retention through archiving. Permanent retention of electronic records through archiving can be handled by the agency or through transfer of the records to the Archives at the Library of Virginia. Destruction of electronic records must be accomplished in accordance with LVA retention and disposition schedules and in a manner that permanently eliminates or deletes the electronic records, beyond any possible reconstruction.

Requirements related to the dispose phase include:

ERM-R-10

Disposition of Electronic Records – Agencies shall develop and implement procedures to ensure electronic records are disposed of in a timely fashion as scheduled by their retention and disposition schedules.

Rationale

- Electronic records in the possession of an agency that meet their retention schedule for disposition criteria and that have not been disposed of in a timely manner per their retention and disposition schedules are subject to FIOA requests and legal holds.

The exceptions to destroying records in accordance with an established retention schedule are holds placed on records due to audits, litigation, investigations; or FOIA requests for information. In this document this is referred to as a "legal hold", which is defined as a process an agency uses to protect and preserve all forms of relevant information related to an audit, FOIA request, or when litigation is reasonably anticipated or in progress. If records become part of an audit, litigation, or

investigation, the retention period does not change. When the hold is lifted the retention period picks up as if the hold never occurred. Therefore, if a retention period expired while a record was on hold, the record should be destroyed immediately after the hold is lifted.

ERM-R-11 Identify Electronic Records Subject to Legal Hold –
Agencies shall identify all records custodians (staff and/or vendors) that might have electronic records subject to a litigation hold and ensure that the custodians are aware of their preservation responsibilities.

ERM-R-12 Legal Hold – Agencies shall develop and implement procedures to ensure all electronic records identified and documented as related to a specific legal hold event be preserved and protected. This includes ensuring that those records will not be destroyed or reformatted until the event resulting in the records legal hold has concluded and all appeal periods are exhausted even if the duration exceeds the relevant records retention and disposition schedule.

When disposing of electronic records either for archiving purposes or to permanently destroy records, agencies must ensure that those records are totally removed from their storage devices in such a manner that the information contained in those records cannot be reconstructed. VITA's Commonwealth Security has several security related standards that contain requirements related to effectively removing data from storage devices that must be followed.

References

ANSI/AIIM 21: 2009, *Standard Recommended Practice – Strategy Markup Language – Part 1: STRatML Core*

<http://www.aiim.org/productcatalog/Product.aspx?id=2230>

AIIM TR32-1994 *Paper Forms Design Optimization for Electronic Image Management (EIM)*

http://www.techstreet.com/standards/AIIM/TR32_1994?product_id=1314

AIIM TR33-1998 *Selecting an Appropriate Image Compression Method to Match User Requirements*

http://www.techstreet.com/standards/AIIM/TR33_1998?product_id=1316

AIIM/ASTM BP01-2008, *Best Practices - Portable Document Format Healthcare - A Best Practices Guide*

<http://www.aiim.org/productcatalog/product.aspx?ID=1675>

AIIM ARP1-2009 *Analysis, Selection, and Implementation of Electronic Document Management Systems (EDMS)* <http://www.aiim.org/AIIM-ARP1-2009-Recommended-Practice-EDMS.aspx>

ANSI/AIIM TR41-2006 *Optical Disk Storage Technology, Management, and Standards*

http://www.techstreet.com/standards/AIIM/TR41_2006?product_id=1268605

ANSI/AIIM/ARMA TR48-2006 *Revised Framework for the Integration of Electronic Document Management Systems and Electronic Records Management Systems* http://www.techstreet.com/cgi-bin/detail?doc_no=AIIM%7CARMA_TR48_2006&product_id=1320648

ARMA International, *Generally Accepted Recordkeeping Principles*, Article, <http://www.armacanada.org/documents/GARP%20Generally%20Accepted%20Recordskeeping%20Principles.pdf>

Forrester/ARMA Survey, *Records professionals have a strategic role to play in implementing systems and processes for meeting regulatory requirements, protecting information assets, and easing e-discovery burdens, 2009:*

<http://www.thefreelibrary.com/Forrester%2fARMA+survey%3a+mitigating+legal+risks+drives+software...-a0214202021>

Government of South Australia, *Adequate Records Management Standard*, Commonwealth of Australia, 2008;

http://www.archives.sa.gov.au/files/management_standard_ARM.pdf.

Government of South Australia, *Document and Records Management Systems*, Commonwealth of Australia, 2009:

http://www.archives.sa.gov.au/files/management_standard_documentrecordssystems.pdf .

Government of South Australia, *South Australian Recordkeeping Metadata Standard v4.1*, Commonwealth of Australia, 2009:

http://www.archives.sa.gov.au/files/management_standard_metadata.pdf

Government of Victoria, *Errata for Management of Electronic Records* (PROS 99/007) (v2.0), Department of Victorian Communities, Commonwealth of Australia, 2008, <http://www.prov.vic.gov.au/vers/standard/PROS99-007-Ver2-v1-6-20080701.pdf>

Information Management Journal, *Principles for gaining control of electronic information*, September 1, 2009, <http://www.thefreelibrary.com/Principles+for+gaining+control+of+electronic+information.-a0214202027>

Information Management Journal, *The imperative for Generally Accepted Recordkeeping Principles*, September 1, 2009, http://www.newsfactor.com/story.xhtml?story_id=01200160K5GO

Information Management Journal, *Generally Accepted Recordkeeping Principles*, <http://www.thefreelibrary.com/The+imperative+for+Generally+Accepted+Recordkeeping+Principles%5bTM%5d.-a0214202026>

ISO15489, *Information and Documentation — Records Management — Part 1: General* (ISO/TR 15489-1) 2001, ISO Central Secretariat, Geneva, Switzerland, http://www.iso.org/iso/catalogue_detail?csnumber=31908

ISO15489, *Information and documentation — Records Management — Part 2: Guidelines* (ISO/TR 15489-2) 2001, ISO Central Secretariat, Geneva, Switzerland, http://www.iso.org/iso/catalogue_detail?csnumber=31908

ISO/TR 15801, *Electronic imaging -- Information stored electronically -- Recommendations for trustworthiness and reliability*, ISO Central Secretariat, Geneva, Switzerland, http://www.iso.org/iso/catalogue_detail.htm?csnumber=29093

ISO/TR 18492:2005, *Long-term preservation of electronic document-based information*, ISO Central Secretariat, Geneva, Switzerland, http://www.iso.org/iso/catalogue_detail.htm?csnumber=38716

ISO 19005-1:2005, *Document management -- Electronic document file format for long-term preservation -- Part 1: Use of PDF 1.4 (PDF/A-1)* http://www.iso.org/iso/catalogue_detail?csnumber=38920

ISO 32000-1:2008, *Document management -- Portable document format -- Part 1: PDF 1.7* <http://www.iso.org/iso/search.htm?qt=iISO+32000-1%3A2008&sort=rel&type=simple&published=on>

ISO/TR 15801:2009, *Document management -- Information stored electronically -- Recommendations for trustworthiness and reliability*

<http://www.iso.org/iso/search.htm?qt=ISO%2FTR+15801%3A2009&sort=rel&type=simple&published=on>

ISO/TR 18492:2005, *Long-term preservation of electronic document-based information*

<http://www.iso.org/iso/search.htm?qt=iSO+10196%3A2003&sort=rel&type=simple&published=on>

ISO 32000-1:2008, *Document management -- Portable document format -- Part 1: PDF 1.7* <http://www.iso.org/iso/search.htm?qt=ISO+32000-1%3A2008&sort=rel&type=simple&published=on>

ISO 10196:2003, *Document imaging applications -- Recommendations for the creation of original documents*

<http://www.iso.org/iso/search.htm?qt=iSO+10196%3A2003&sort=rel&type=simple&published=on>

ISO 11506:2009 *Document management applications -- Archiving of electronic data -- Computer output microform (COM) / Computer output laser disc (COLD)*

<http://www.iso.org/iso/search.htm?qt=ISO+11506%3A2009&sort=rel&type=simple&published=on>

ISO/TR 12033:2009, *Document management -- Electronic imaging -- Guidance for the selection of document image compression methods*

<http://www.iso.org/iso/search.htm?qt=ISO%2FTR+12033%3A2009&sort=rel&type=simple&published=on>

ISO/TR 10255:2009, *Document management applications -- Optical disk storage technology, management and standards*

<http://www.iso.org/iso/search.htm?qt=&sort=rel&type=simple&published=on>

ISO 12653-1:2000, *Electronic imaging -- Test target for the black-and-white scanning of office documents -- Part 1: Characteristics*

<http://www.iso.org/iso/search.htm?qt=iSO+12653-1%3A2000&sort=rel&type=simple&published=on>

ISO 12653-2:2000, *Electronic imaging -- Test target for the black-and-white scanning of office documents -- Part 2: Method of use*

<http://www.iso.org/iso/search.htm?qt=ISO+12653-2%3A2000&sort=rel&type=simple&published=on>

ISO 22938:2008, *Document management -- Electronic content/document management (CDM) data interchange format*

<http://www.iso.org/iso/search.htm?qt=ISO+22938%3A2008&sort=rel&type=simple&published=on>

ISO/TR 22957:2009, *Document management -- Analysis, selection and implementation of electronic document management systems (EDMS)*

<http://www.iso.org/iso/search.htm?qt=ISO%2FTR+22957%3A2009&sort=rel&type=simple&published=on>

ISO 23081-1:2006 *Information and documentation- Metadata for Records - Part 1 - Principles* <http://www.iso.org/iso/search.htm?qt=ISO+23081-1%3A2006&sort=rel&type=simple&published=on>

ISO 23081-2:2009 *Information and documentation- Metadata for Records - Part 2: Conceptual and implementation Issues*
<http://www.iso.org/iso/search.htm?qt=ISO+24517-1%3A2008&sort=rel&type=simple&published=on>

ISO 24517-1:2008, *Document management -- Engineering document format using PDF -- Part 1: Use of PDF 1.6 (PDF/E-1)*
<http://www.iso.org/iso/search.htm?qt=ISO+24517-1%3A2008&sort=rel&type=simple&published=on>

ISO 23868:2008 *Document management -- Monitoring and verification of information stored on 130 mm optical media*
http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=41888&ics1=37&ics2=080

AIIM TR34-1996 *Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management (EIM) and Micrographics Systems* (Approved as an ISO standard in 2009 but not yet published)

Library of Virginia, *Virginia Public Records Management Manual*
<http://www.lva.virginia.gov/agencies/records/manuals/vprmm.pdf>

NASCIO, *Electronic Records Management and Digital, Preservation: Protecting the Knowledge Assets of the State Government Enterprise*, Lexington, KY

PART I: Background, Principles and Action for State CIOs,
<http://www.nascio.org/publications/documents/NASCIO-RecordsManagement.pdf>,

Part II: Economic, Legal, and Organizational Issues
<http://www.nascio.org/publications/documents/NASCIO-RecordsManagementPart2.pdf>

Part III: Management Leads and Technology Follows – But Collaboration is King! <http://www.nascio.org/publications/documents/NASCIO-RecordsManagementPart3.pdf>

NASCIO, *Electronic Records Management and Digital Preservation: Protecting the Knowledge Assets of the State Government Enterprise, Part II: Economic, Legal, and Organizational Issues:*
<http://www.nascio.org/publications/documents/NASCIO-RecordsManagementPart2.pdf>

NASCIO, *Virginia's E-Records Approach through Enterprise Architecture* highlighted by NASCIO in its article on E-Records Challenge
<http://www.nascio.org/publications/documents/NASCIO-E-RecordsChallenges.pdf>

NARA (National Archives and records Administration), ERA Program Management Office (ERA PMO), Electronic Records Archive (ERA), *Electronic Records Archives, Introduction to Policies, Templates, and Requirements Concepts*, (TEMP v1.0), (WBS #1.1.15), 2003, <http://www.archives.gov/era/pdf/policies-templates-requirements.pdf>

Office of Management and Budget, *Federal Enterprise Architecture Records Management Profile*, V 1.0 December 2005: <http://www.archives.gov/records-mgmt/policy/rm-profile.html>

NARA (National Archives and Records Administration), *Agency Recordkeeping Requirements: A Management Guide*, College Park, MD.: NARA, Office of Records Administration, 1996; <http://www.archives.gov/records-mgmt/policy/agency-recordkeeping-requirements.html>

NARA (National Archives and Records Administration), *National Federal Enterprise Architecture (FEA) Records Management Profile*, version 1.0,: <http://www.archives.gov/records-mgmt/policy/rm-profile.html>

State of Kansas, *Kansas Electronic Records Management Guidelines*, Kansas State Historical Society: http://www.ksks.org/government/records/electronic/electronicrecordsguidelines.htm#3_1

State of New York, Office of Archives and Records Management, *Electronic Records*, 2009. http://www.archives.nysed.gov/a/records/mr_erecords.shtml

State of Texas, ACE Data and Electronic Records Management Domain, *Data and Electronic Records Management Best Practices – Roles and Responsibilities*, Texas Department of Information Resources State of Texas, April 2006 <http://www.dir.state.tx.us/pubs/derm/roles.pdf>

U.S. Department of the Interior, *Interior Enterprise Architecture*, Chapter 8 *Records Management Architecture* V 2.0, October 2003 <http://www.doi.gov/ocio/architecture/documents/chapter8.doc>

U. S. Department of Defense, (DoD 5012.2-STD) Design Criteria Standard for Electronic Records Management Software Applications, April 2007: <http://jltc.fhu.disa.mil/recmgt/p50152stdapr07.pdf>

U. S. Department of Defense, **Joint Interoperability Test Command**, **Records Management Application (RMA)**, *Electronic Records Management Software Applications Design Criteria Standard*, April 25, 2007 <http://jltc.fhu.disa.mil/recmgt/p50152stdapr07.pdf>

University at Albany, Center for Technology in Government, *Practical Approaches to Electronic Records Management and Preservation*, Albany, NY, May 1998. http://www.ctg.albany.edu/publications/reports/models_for_action/models_for_action.pdf

University of Pittsburgh, School of Library and Information Sciences,
Functional Requirements for Recordkeeping, 1995,
[http://web.archive.org/web/20000818163633/http://www.sis.pitt.edu/~nhprc/pr
og1.html](http://web.archive.org/web/20000818163633/http://www.sis.pitt.edu/~nhprc/pr
og1.html)